

DEVICE AND METHOD FOR SUPPLYING MOISTURE INTO THE
INTERIOR OF A LAUNDRY DRIER

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The present invention relates to a device and a method
5 for supplying moisture into the interior of a laundry
drier. The invention further relates to a use of the
device.

After a certain time textiles, especially articles of
10 clothing, become laden with odours as a result of body
odours or environmental influences and must be washed
or cleaned. In order to be able to avoid frequent
washing or cleaning and thereby protect the textiles,
it is known to air textiles. If the airing is carried
15 out in a domestic laundry drier, solutions are known in
which the textiles together with a cloth impregnated
with a cleaning agent, is placed in a bag and placed in
the domestic laundry drier. After the treatment in the
laundry drier, the odours are removed and the article
20 of clothing is scented.

A disadvantage of this treatment is that after the
treatment the textiles frequently smell unpleasantly
strongly of the cleaning agent. In addition, for each
25 airing process additional costs are incurred for the
cleaning cloth.

Further, a drying device for textiles is known from the
German utility model GM 7341276. The drying device
30 comprises a steam generator which comprises a heating
coil for vaporising water in the housing of the steam
generator. For steaming and deodorising textiles, steam
from the steam generator is fed into a box-like housing
consisting partly of a flexible film in which textiles
35 are suspended.

The disadvantage of this drying device is that this must have a very complex structure in order to make it possible for the steam to be distributed uniformly in the box-like housing. In addition, as a result of the
5 energy required by the steam generator, the energy requirement for this drying device is comparatively high.

It is thus an object of the invention to provide a
10 device and a method for supplying moisture into the interior of a laundry drier, wherein the method should be simple to implement, the device should have a simple structure and in addition, can be operated inexpensively.

15 The invention is based on the knowledge that this object can be provided by a device in which steam serves as moisture, a heat source already present in the laundry drier is used to produce the steam from a
20 liquid and at the same time, direct contact between the liquid and the textiles to be treated can be reliably avoided.

The object is solved according to the invention by a
25 device for supplying moisture into the interior of a laundry drier according to claim 1, by the use of such a device according to claim 10 and by a method according to claim 11.

30 Features and details which are described in connection with the device according to the invention also apply to the use according to the invention and for the method according to the invention, and conversely in each case.

35 The object is solved according to a first aspect of the invention by a device for supplying moisture into the

interior of a laundry drier wherein the device has a receiving area for receiving liquid and a liquid-impermeable sleeve surrounding this receiving area, which has at least one outlet opening for dispensing
5 moisture, wherein the device is characterised in that the sleeve is permeable to heat.

Designated as a heat-permeable sleeve in the sense of this invention is a sleeve which as a result of thermal
10 conductivity and/or openings for example in the form of pores, allows such an intake of heat into the receiving area which is sufficient to vaporise the liquid located in the sleeve. As a result of this embodiment of the device, a separate heating device for vaporising the
15 liquid is not required. Rather, the heating device already provided in a laundry drier which in conventional operation of the drier serves to heat the air in the interior of the drier, is used at the same time to vaporise the liquid in the device. This yields
20 technical and economical advantages since the manufacture of the device and its use are facilitated. In addition, since the sleeve is furthermore impermeable to liquid, escape of the liquid located in the receiving area and thus contact between the liquid
25 and the textiles to be treated is avoided. As a result, damages, discoloration or other types of negative influences, especially on textiles which are not washable, can be avoided. At the same time however, moisture in the form of steam can leave the device via
30 the at least one outlet opening and the textiles can thus be treated. The removal of odours during the airing process can thus be accelerated and improved compared with airing processes which exclusively use air.

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At the same time, the device according to the invention allows a defined quantity of moisture to be brought

into a laundry drier in the vapour phase and supplied into the interior of the drier.

The device according to the invention is preferably a
5 separate device which can be brought into the drum of
the laundry drier together with the textiles to be
aired, possibly in a bag, and which can be removed from
this again. The device thus preferably has no
connection to the laundry drier. In one embodiment of
10 the invention, however, the device can have at least
one connecting means for connection to the drum of the
laundry drier. As a result of this fixing of the device
in the drum, a uniform supply of steam to the textiles
located in the laundry drier can be ensured. The
15 connecting means can be known means, such as for
example, loops, hooks or clips.

Especially preferably, the device according to the
invention is suitable for receiving water. As a result
20 of the penetration of heat into the device, the water
can be vaporised to form steam which can then penetrate
as moisture into the drum and into the textiles located
therein and thus, these can be treated.

25 At least one outlet opening is provided for dispensing
moisture in the device according to the invention. This
is preferably configured so that moisture can pass
through the outlet opening in one direction but liquids
cannot pass through the outlet opening. The outlet
30 opening can, for example, be a tube or a hose in which
a valve is provided. However, the outlet openings can
also be pores in the material of the sleeve which only
allow moisture to pass through in one direction. As a
result of the last-mentioned embodiment in which the
35 outlet openings are a part of the material of the
sleeve in the form of pores, a sleeve can be provided

which is overall impermeable to liquid and at the same time permeable to moisture.

In a further embodiment, the sleeve consists of a flexible material. The advantage of such a sleeve is that no damage to the textiles which are to be treated in the laundry drier is to be feared. Thus, the sleeve especially preferably consists of a membrane which is preferably semi-permeable for moisture, especially steam, and at the same time is watertight. Such membranes are sold for example by the company W.L. Gore & Associates under the trademark Goretex®. The semipermeability is preferably additionally direction-dependent, i.e., it allows the diffusion of moisture only from inside the device to the outside of the sleeve but not in the opposite direction.

In one embodiment the device further has a closeable filling opening for incorporating liquid into the receiving area. This filling opening allows the device to be used many times.

A carrier for liquids can be provided in the receiving area. As a result of this carrier, which can for example be a foam-like material, on the one hand the surface of the liquid provided or incorporated in the receiving area, can be increased whereby vaporisation of the liquid in the receiving area can be accelerated and on the other hand, transport of the device even in the filled state can be simplified by the carrier.

The device according to the invention for removing odours from textiles is preferably used in a laundry drier. In this use, the properties of the device according to the invention can be ideally used. Since the removal of odours by steam, for example, is especially carried out for textiles, which must

normally undergo dry cleaning, it is of particular importance that the textiles do not come in contact with the liquid, e.g., the water located in the receiving area. In the device according to the
5 invention, this is accomplished by the liquid-impermeable sleeve which nevertheless however, allows the supply of moisture in the steam phase, for example, via valves or pores of a membrane, into the interior of the drier.

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Further, the object forming the basis of the invention is solved by a method for supplying moisture into the interior of a laundry drier, wherein a device, which contains liquid, is brought into the interior of the
15 laundry drier, heat is produced by means of the heating device of the laundry drier, this heat brings the liquid in the device to vaporisation and the moisture thus obtained is dispensed via at least one outlet opening for moisture in the device to the interior of
20 the drier.

The invention is described subsequently with reference to the appended drawings which relate to a possible exemplary embodiment of the invention. In the figures:

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Figure 1: is a schematic perspective view of an embodiment of a device according to the invention;

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Figure 2: is a schematic sectional view of the embodiment of the device according to the invention shown in Figure 1.

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Figure 1 shows a possible embodiment of the device 1. In this embodiment the device 1 has a sleeve 2 which has a rectangular shape. A filling opening 21 is provided in the top of the sleeve 2. The filling

opening 21 is covered by a lug 211. In the embodiment shown the lug 211 is larger than the filling opening 21. At one end 212 the lug 211 is fixedly connected to the sleeve 2. The free sides of the lug 211, i.e., the
5 sides which extend over the filling opening 21 have on the underside, i.e., on the side facing the body, a velcro strip 213 by means of which the lug 211 can be connected to the outside of the sleeve 2. The filling opening 21 can thus be closed.

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As can be seen from Figure 2, a receiving area 3 is formed in the interior of the sleeve 2. In the embodiment shown a sponge 31 is contained in this receiving area 3 as a carrier for liquids. This sponge
15 31 can be impregnated with liquid, especially with water.

In the embodiment shown the material from which the sleeve 2 is made has pores (not shown) and is treated
20 such that it allows moisture to pass from inside the sleeve 2 towards the outside but does not allow any liquid to enter in.

If, after being filled with water or another liquid and
25 the filling opening 21 being closed by the lug 211, this device 1 is placed in the drum of a laundry drier, and this is switched on, the heating device of the laundry drier heats up. As a result, the device 1 and thus the liquid contained in the receiving area 3 is
30 heated by the heating device of the laundry drier. On reaching a certain temperature, the liquid in the receiving area 3 vaporises and as a result of the semipermeability of the sleeve 2, can escape from the device on all sides via the pores of the membrane. The
35 steam can penetrate into the textiles located in the drum, there bind the odorous substances to the water

molecules and the odorous substances can be separated together with the water at a condenser or filter.

After the end of the airing process, the device 1 can
5 be removed from the drum again, opened again and filled with water before being brought back into the drum for the next treatment process.

The size of the device is selected such that this can
10 easily be inserted into the drum and nevertheless can accommodate a sufficient quantity of liquid to treat the textiles in the drum.

The embodiment shown in the figures is only one
15 possibility in which the invention can be realised.

For example, however, it is also possible to make the device from a liquid-tight and moisture-impermeable material and provide an opening for example, which is
20 connected to a valve or in which a membrane can be provided via which moisture can escape but liquid is held in the device. A pressure valve can be used as the valve for example, which opens as a result of the pressure formed in the device as a result of the
25 evaporation of the liquid and closes again directly after the pressure drops. In such an embodiment, the use of a carrier for the liquid in the receiving area is particularly important since this can largely prevent any escape of the liquid contained therein even
30 when the valve is opened.

Furthermore, the device is not restricted to providing a filling opening in the device. It is also possible to select the material of the sleeve such that this is
35 permeable in the direction from outside the device into the inside of the device, especially in the receiving area of the device for liquid but prevents any escape

of liquid. In this embodiment the device can be filled with liquid, by dipping the device into the liquid and impregnating there with said liquid. Furthermore, the sleeve can be formed from a plurality of layers which
5 together form the desired properties of the sleeve.

If a filling opening is provided, the device according to the invention is not restricted to the closure mechanism shown in the figures, rather other
10 embodiments of velcro closure mechanisms or other closure means, such as zipper closures can also be used. Also the place where the filling opening is provided is not restricted to the position shown. For example, it is also within the scope of the invention
15 to configure the sleeve in the form of a bag which can be opened completely on one side. A zipper closure mechanism, e.g. with longitudinal profiles, can also be provided on this side, by means of which the sleeve can be closed in a liquid-impermeable fashion, especially
20 watertight.

If a filling opening is provided, it can be especially advantageous to provide a connecting means to the device by means of which the device can be connected to
25 the drum. By means of the connection of the device to the drum it can be ensured by suitably positioning the connecting means that the filling opening and the means provided for closing and sealing the filling opening, such as velcro fasteners for example, are always facing
30 the drum. Any damage to the textiles by the closure means can thus be prevented.

The shape of the device can also be differently selected so that this can have the form of a sphere,
35 for example.

With the device according to the invention a moisture generator, especially a steam generator is provided which can be inserted in the drum of a laundry drier and, therein without having its own heat source, can
5 produce moisture and dispense it to textiles without the textiles coming in contact with a liquid.